REMARKS

Applicants respectfully draw attention to Figures 3 and 4 and the accompanying description in the specification. As plainly shown by Figures 3 and 4, the groove itself forms a high frequency sinusoidal mark at zero crossings of the wobble. Thus, claim 1 has been amended to eliminate the previous limitation objected to as new matter to reflect that the inventive feature that it is the groove that forms the claimed sinusoidal marks as recited in claim 1: "a first plurality of sinusoidal marks located at zero crossings of the wobble, each sinusoidal mark being formed from a sinusoidal deviation of the groove."

Moreover, consider Applicants' prior art figures 1 and 2, which both use the same line figure representation as used in Applicants' figure 4 to show a <u>groove</u> (see, e.g., the description of figures on page 4). The grooves in figures 1 and 2 possess a wobble. As would be appreciated by those of ordinary skill in the optical disk arts, these wobbles are simply a sinusoidal variation in the groove itself as illustrated. Indeed, Applicants make this abundantly clear to the reader by noting that a 2-beam mastering system may be used to place information in the form of pits on the land area between the tracks as noted on page 2, lines 22 through 30. In contrast, the manufacture of a conventional wobble requires just a <u>SINGLE</u> beam mastering system because the single beam cuts the groove and thus cuts also the wobble (which is just a sinusoidal devation on the groove).

Applicants then reinforce this by noting that "conventional mastering equipment inserts the HFWMs in the wobble of the tracks" on page 4, lines 29 through 30. As discussed above, conventional mastering equipment uses just a single beam, which implies that the wobble and any HFWMs inserted into the wobble are deviations of the groove itself. Here, because Applicants have expressly stated that the HFWMs are "in the wobble of the groove" (page 3, lines 17-18), one of ordinary skill in the art would plainly appreciate that the groove itself defines the HFWM. Otherwise, Applicants would have had to say that the HFWMs were defined <u>in one wall</u> of the groove, as was expressly done in the Fuji reference.

Claims 1-3, 5-10 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuji (EP 0 786 767). Claims 1-3, 5-10 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Asano (EP 0 969 452). Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Fuji or Asano in view of Kobayashi et al. documents ('985) or ('522). Applicants overcome the rejections as follows.

Consider the advantages of the spiral groove configuration for an optical disk recited in claim 1. Specifically, each high-frequency wobble superimposed on the low-frequency wobble defined by the groove is "formed from a sinusoidal deviation of the groove." Support for this limitation is shown, for example, in Applicants' Figure 4 wherein each high frequency wobble mark (HFWM) is shown as a sinusoidal deviation of the groove. In other words, the groove itself forms both a low frequency sinusoidal deviation and a high frequency sinusoidal deviation.

The Fuji reference stands in sharp contrast to such an arrangement because its high frequency sinusoidal deviation is merely a deviation of one side of the groove – see, e.g., Figures 1, 6, 10, 12, 15, 18, 25, and 26 in the Fuji reference. Thus, the abstract of the Fuji reference states "one of the sidewalls of a groove 2 is wobbled by a wobble signal." This difference has very significant ramifications regarding the relative advantages of Applicants' invention. Because Applicants wobble the groove itself, only one laser beam is required to cut the groove in the master disk that will be used to reproduce the optical disks having the HFWM-modulated spiral groove. In sharp contrast, Fuji requires two laser beams: one laser beam to cut the sidewall without the higher-frequency wobble and another laser beam to cut the sidewall with the higher-frequency wobble. See, e.g., Col. 25, line 28 through Col. 26, line 38 discussing a groove cutting device generating two light beams (one for each groove sidewall). Because Fuji requires two laser beams, its manufacture is much more complicated than that necessary for the groove recited in claim 1: the two laser beams must be carefully aligned, thereby necessitating expensive and complicated alignment means. In contrast, Applicants can manufacture the groove recited in claim 1 using just a single laser beam as would be normally done to cut a conventional spiral groove, making manufacture substantially less expensive and complicated.

Yet another substantial advantage for the groove recited in claim 1 over the Fuji reference is that because Fuji deviates just a single sidewall, the amplitude of Fuji's higher-frequency wobble cannot be any greater than the thickness of the groove. In sharp contrast, because Applicants are wobbling the groove itself to create the high frequency wobble marks (thus the limitation that each high-frequency wobble superimposed on the low-frequency wobble defined by the groove is "formed from a sinusoidal deviation of the groove"), there is no groove-width-induced limitation on the amplitude of the high-frequency wobble recited in

claim 1. This has important ramifications with respect to the signal-to-noise ratio resulting from the detection of the higher-frequency wobbles – Applicants can adjust their high-frequency wobble mark's amplitude appropriately to ensure that the signal-to-noise ratio is sufficient. This is particularly critical with respect to the use Applicants make of the resulting information field from the HFWMs, namely addressing. Because Fuji makes no teaching or suggestion for modifying its disclosure to provide these important advantages and features, claim 1 is patentable over the Fuji reference.

The Asano reference adds nothing further. All Asano discloses is the use of wobble marks "to indicate the beginning of data, the timing of signal/reproduction, and determining whether the laser beam in on the center line." Thus these marks are purely timing marks such that each detected mark is used for generation of a reference timing signal. See, e.g., Col. 12, lines 21 through 26, wherein Asano states: "The reproduced data amplified by reproduced signal amplify circuit 19 is also applied to address mark detection circuit 23 of the present invention. Address mark detection circuit 23 detects the address mark formed at the groove of the magneto-optical disk shown in Fig. 2 or 3 to generate a reference timing signal." In that regard, Applicants respectfully traverse the assertion by the Examiner that Asano on page 5, line 55 through column 6, line 23 describes the information field recited in claim 1. The only reference to digital data in that section of Asano is to the data stored on the disk, whose detection is assisted by the reference timing signal that is generated from the address marks. Accordingly, Asano makes no teaching or suggestion for the information field recited in claim 1.

The Kobayashi reference adds nothing further as it makes no disclosure whatsoever regarding the use of higher frequency wobble marks superimposed on a conventional wobble. Thus, claim 1 is patentable over the art of record

Because claims 2 – 10, and 36 depend either directly or indirectly upon claim 1, they are patentable over the art of record for at least the same reasons.

CONCLUSION

For the above reasons, pending Claims 1 – 10, and 36 are in condition for allowance and allowance of the application is hereby solicited. If the Examiner has any questions or concerns, a telephone call to the undersigned at (949) 752-7040 is welcomed and encouraged.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Linda Bolter
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August 18, 2004
Date of Signature

Respectfully submitted,

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